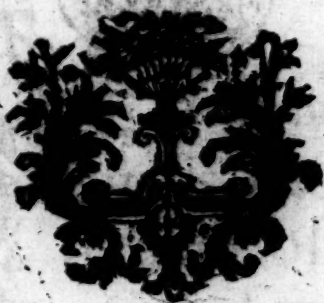


A CRITICAL
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OF THE *Supl.*
NEW OPERATION
FOR A
CATARACT.

By Mr. O'HALLORAN, of *Limerick*,
Surgeon and Man-Midwife.—Author of a New
Treatise on the CATARACT.



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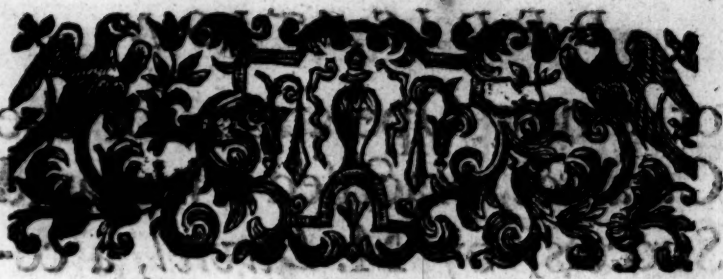
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M,DCC,LV.

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By MR. JOHN ALLORAN, of Lincolns,
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Treatise on the CATARACT.




DUBLIN:
Printed by S. P. O'NEILL, for the AUTHOR.
MDCCLV.



^{T O}
EDWARD BARRY, Esq;

^{O F}
The College of Physicians,
Dublin, Fellow of the
Royal Society, and Physi-
cian General to the Army.

S I R,

 **H E** following Es-
say is the Conse-
quence of a Paper
read before the *Roy-
al Society*, in the Winter of
1752, describing the Manual
of

DEDICATION.

of a new Operation for the Cataract, practised with rapid Success, by M. *Daviel*, a celebrated Surgeon of *Paris*. So curious an Operation could not fail of raising the Attention of that illustrious Body, especially when attended with such happy Consequences, that out of an hundred Patients, which he operated on, this way, but fifteen miscarried. Being particularly attached to this Part of Surgery, I was naturally lead to enquire, *Why it did not always succeed?* To this purpose I made several Experiments, to know when it promised fairest for Success, and when to be laid aside: These

DEDICATION.

These Papers, at the Instigation of a couple of learned Friends, I laid before the *Royal Society*, and had the Satisfaction to find them well received. For tho' in fact this Operation has many Advantages over any other antecedent to it, yet it is not without its Faults, nor to be attempted indiscriminately in all Cases: To demonstrate this, is the Intent of this Work.

But to describe the Operation itself, with Accuracy, and Perspicuity, required more Trouble than I at first supposed. For as I could not procure M. *Daviel's* own Account of this Operation, and
that

DEDICATION.

that the Paper sent to *London* was from a Spectator only, I could not safely rely on that Detail. To remedy this Defect, I have considered this Operation anatomically and practically; and shall be bold to affirm, that if it be not precisely his, it will be found, at least a safe and warrantable Method. To make it more acceptable, I have attempted to investigate the Theory of a Cataract in a new manner, and, I hope, with more Success than has been yet done. For tho' the Theory of Disorders may not seem absolutely necessary to Surgery, nevertheless a Theory, where the Data are taken from Nature,

DEDICATION.

ture, and which in every part coincides with Experience, is not without its Advantages.

To give this Enquiry a Weight with the Publick, I thought the Name of a Gentleman eminent in his Profession, and whose Capacity was universally acknowledged, was necessary: For such a Person I could not be long in determining in Favour of Doctor BARRY. But this was a Choice of Inclination, as well as Interest. I acquainted you of my Intentions of addressing it to you, and you were pleased to permit it, on a Presumption, that it might be useful to the Publick. To preserve the Opinion

DEDICATION.

nion of so good a Judge, I have endeavoured to make it as much so as the Subject would allow of; and if I have failed in the Attempt, I have at least the Pleasure of assuring you, in this publick manner, that I am, with great Respect and Esteem,

S I R,

Your most obedient,

humble Servant,

Limerick, Feb.

2d. 1755.

SIL. O-HALLORAN,



CRITICAL ANALYSIS, &c.

THAT the Cataract is constantly, an Opacity of the Chrystalin Lens, so many glaring Facts prove, that I presume, no one now, will be hardy enough to deny. But tho' the Seat of this Disorder is well known, the Causes of it, are not yet sufficiently explained. Philosophers in general, if they find by Experiments on external Bodies, pretty near the same Phænomena ensue, as do, in some morbid Cases, immediately

A

ately

ately resolve the Cause of these Appearances, into the Cause, of such Disorders. But not to Elucidate this Position, by Instances drawn from other Disorders, we shall confine ourselves, to what regards our present Enquiry only. For Example, by observing that Acids constantly destroy the Transparency of the Chrystalin Lens, when infused in them, Oculists generally attribute the Cause of this Disorder, to some predominant Acid in the Blood. But they should at the same time recollect, that the same Acid, which offuscates the Chrystalin, will also, the Vitreous Humour, and destroy the whole Eye—but in the Cataract no part, but the Chrystalin is affected; and by what Mechanism, they will convey this Acid to the Chrystalin only, (which has no manner of Connection, or Communication, with any other Part) I am at a loss to guess. And from repeated Tryals, I affirm, that a Morbid Chrystalin, to the Taste, &c. manifests no sign of an Acid; nor does the Liquor that surrounds it.

In order therefore, to investigate the Causes of this Disorder satisfactorily; and that our Theory should not arise in Contrast with Experience, which sometimes happens, let the following Axioms, or Truths

Truths drawn from repeated Experiments, be remembered :

1. The constant Seat of a Cataract, is, the Chrystalin Lens, which is lodged in a Capsula, or Covering, to which it has no Adherence; and *which Capsula, is always transparent.*

2. An Opaque Chrystalin, is smaller than a transparent, or sound one.

3. The Liquor that surrounds the Chrystalin, is neither augmented, or diminished, by the Alteration of this Body; nor is it in the least changed, from that which envelopes a sound Chrystalin.

These Preliminaries being settled, we shall divide the Causes of Cataracts, into External, and Internal. The External Causes, are the following—Whatsoever Body, which by striking violently on the Eye, compresses the Chrystalin, will destroy its Transparency, and cause a Cataract; of which Brisseau and Maitre-Jan give Instances. For the Chrystalin being, an Unelastick Body; and being composed of several little transparent Laminæ, so joined as to give a free Passage to the Rays of Light, if any Body, rudely strikes against them, these Laminæ are decomposed, compressed, and Sight destroyed.

And this is so true, that if you but gently press a sound Chrystalin between your Fingers, you will immediately see it lose of its Transparency. And for the same Reasons, any Solution of Continuity in this Part, will produce a Cataract: an Instance of which I gave, in my Treatise on the Cataract; and since have met with a more remarkable one, which as it may serve to direct others, in a similar Exigency, I shall briefly relate.

In May 1751, the only Child of a wealthy Clothier here (in *Limerick*) was playing with other Children, in a Shoe-Makers Shop; and taking up, a small cutting Knife, it by some Accident struck into the Ball of the Eye. It pervaded the anterior Part of the *Sclerotica*, Part of the *Cornea Lucida*, wounded the *Foramen* of the *Iris*, and the Chrystalin Lens. Being immediatly sent for to prevent an Inflammation, I blooded her; and as the Wound was large I was apprehensive that the Humours of the Eye, might pass thro' the Aperture, to prevent which I had a thin Plate of Lead beat Concave, and Holes made at its two Sides: the Concavity was to answer to the Convexity of the Eye, and the Holes to have Tapes in them, to fasten round the Head. The Dressings were,
a little

a little Saffron, infused in warm Milk, to which was added, a small Quantity of Brandy. With this the Eye was bathed Morning and Evening, and fine Linen Compresses wet in it, and applied under the Leaden Compress: the Child was confined to her Bed, and the next Morning, took a Lenient Cathartick, and was ordered a low attenuating Diet. Tho' the Chrysalin, thro' the Pupilla seemed clear, yet I assured them, the Child would have a Cataract, which they did not attend to. In a few Days, the Wound healed, without any material Symptom, except, the Ousing out, of a thin Filamentous Substance, which by the Use of a little Powder, made of refined Sugar, and Roch Allum, was soon destroyed—the Child remained well ever since, but the Opacity of the Chrysalin is visible.

Any Inflammable Substance, such as violent flashing of Gun-Powder; a strong Steem of Quick-Lime, boiling Water, &c. will produce Cataracts: for if you thrust the Head of a Dog, alive into boiling Water, and afterwards dissect his Eyes, you will find the Chrysalin, hard, Contracted and Opaque. Violent Flashes of Thunder, are also said to cause Cataracts; tho' when I
was,

was, some time ago, at *Bristol*, in my Return to *Ireland*, some Sailors, who had lost their Sight, by violent Flashes of Lightning, on the Coast of *Guinea*, applied to me: but I found, in every one of them, the Opacity on the Cornea, which formed, one each a Staphiloma. The Cornea also, I found affected only, in another Person, who had lost the Sight of one of his Eyes, by Quick-Lime. But whether the Chrystalin be also affected, in these Cases, I shall not positively declare, tho' from the following Instances, I doubt if it be always the Case.

A poor Man, who had a Staphyloma, which projected a good deal beyond the Lids, I, in, part removed, by an Operation, and in some time it began to be restored to its former Transparency, when I found the Chrystalin clear, and his Sight, a good deal better.

Close Application to fine Work, constant Reading and Watching, are looked upon as the Causes of Cataracts; : but I much doubt, if they can be constantly deemed Causes of this Disorder, tho' the Antients looked upon nothing, more pernicious to Sight, than Watching, as may be collected out of these Verses, in the *Schola Saternitana*.

Balnea,

A Critical Analysis.

7

*Balnea, Vina, Venus, Ventus, Piper, Allia,
fumus, Porri cum Cepis, faba, fens, fletusque Sin-
api: Sol, Coitusque, Ignis, labor, ictus, Acumina,
pulvis, Ista Nocent oculis, sed Vigilare magis.*

For as there are Numbers of Gentlemen, much advanced in Years (and of such I know many) who have in a manner, laid out their whole Lives in reading without any Obstruction to Vision, I am inclined to think, that close Application, where there is no previous Indisposition in the Eye, is not so bad; and to this, and not the Reading I attribute Milton's Loss of Sight, as well as Homer's.

The Internal Causes of a Cataract, may be divided, into, 1. These occasioned from a *mala formatio partium*, and 2. These which are the Consequences, of another Disorder.

Some People, without any previous Indisposition, and who never applied close, either to Reading, or Work, are subject to Cataracts. These People, are generally of a cold

cold Constitution, and the Blood moves slow : in Consequence of this, the Eye has not that usual Briskness, observed in People of a warmer Constitution, and this Coldness contracts the external Laminæ of the Chrystalin. The Patient now imagines, that Hair, or fine Dust falls before his Eyes—Anon Webbs. In some time after, Snow appears to him, to be falling, and most Bodies seem, of a greyish Colour : the Diameter of the Pupilla encreases ; and you can sensibly behold the Discoloration of the Chrystalin. The Patient seems also, to feel a Coldness in his Lids, and Eye—As for the Head-ach, which, sometimes accompanies the Formation of Cataracts, I do not deem it, as a Concomitant Symptom of this Disorder, because several Cataracts are formed without Head-ach ; and others have had, their whole Lives, violent ones, without any Obstruction to Vision. Now, that Cataracts are thus formed, familiar Experiments shew ; for expose a Chrystalin to the Cold, and it shall become, both opaque, and contracted. But you may object, that the Cold in the Eye, in Consequence of slow Circulation, can bear no Analogy, to that of a Chrystalin, exposed to the cold Air. But
if

if you reflect, that the vitreous Humour, as well as Chryſtalin, in the Eye, are naturally cold; that no Blood-Veſſels paſs thro' them; that a gentle Warmth preſerves the Tranſparency of the Chryſtalin, which is again clouded by Cold; and that no ſuch Phænomenon happens to the vitreous Humour which in the intenſeſt Cold preſerves its Tranſparency; and at the ſame time recollect, that the Seat of a Cataract, is always centered in the Chryſtalin, you will change your Opinion. But we will confirm this Theory, by more familiar Experiments—Obſerve but a Perſon, who, upon plentiful Blood-letting begins to faint, he grows pale, his Eyes loſe of their Tranſparency, Objects appear green, they then, ſcatter, the Chryſtalin thro' the Pupilla, ſeems greeniſh; he loſes his Sight, and his Senſes ſeem abſorbed.

———— *tarda trementi*

Genua labant, ſubitò, pallor ſimul occupat ora,

Caligant oculi rigidi, vox faucibus hæret.

Here the external Laminæ of the Chryſtalin ſeem a little to Collapse, thro' the Slowneſs of Circulation; but as the Cauſe does not

continue, he soon recovers the usual Briskness of them.

But to prove this more effectually, I shall give the following Story, which I had from a particular Friend of mine—Being with the late Sir *Peter Warren*, at the Siege of *Cape-Breton*, he was one very cold Night, ordered upon some Expedition, from his Ship—He was away about two Hours, and on his Return, was preparing for Bed; but found his Sight scatter, and in a few Minutes, became perfectly blind. He immediately got a good Fire, and some hot Punch, which after drinking some Glasses, animated him a good deal, and he insensibly recovered his Sight. This Story he told me, the following Winter; but, with these additional Circumstances, that he was subject at Times, and particularly in cold Weather to an Impediment in his Sight; and it seemed to him, as if Hairs were swimming in the Air—this Complaint I effectually removed, by Means of an Ophthalmick Spirit; and he has had, no Return of that Complaint since, as he assured me about a Twelvemonth ago.

Violent Inflammations of the Eye, and particularly the Chemosis, often cause a Cataract; for the violent Heat in the Eye, dissipates

sipates the Moisture of the Chrystalin, and renders it hard, dry, and opaque. And this is so true, that if you put a Chrystalin, enclosed in its Capsula, into hot Water, it will in a little time, become opaque—There is, in the *Medical Essays of Edinburgh* a Story of a Chrystalin's being extracted thro' the Cornea, in a violent Inflammation of the Eye, and the Inflammation, and other Symptoms soon after ceased. From this, and for the following Reasons, I am inclined to think, that Cataracts are oftner produced this Way, than is generally supposed. For pour on an Eye, Water very hot, or pretty near boiling, and soon after, dissect it carefully, and you will find the Chrifstalin opaque, its Capsula tore, and itself, between the Iris, and Cornea. Now what the Water occasions, the violent Heat in the Eye, may also; which in the moist Ophthalmia is so great, that the very Water, that runs from the Eye, is in a manner, scalding: add to this, that in this sort of Ophthalmia, especially when very violent, the Patient complains violently, of Dirt's being (or something, like it) in his Eye. Upon often reflecting, on this Complaint, in many Patients, I can yet find no Reason, more plau-

sible, than that of the Chrystalin's being disengaged from its Capsula; and being then, an extraneous Body, occasions the Effect. If this were the Case (for I have no Certainty, in my own Practice to warrant it) an Opening, in the inferior Part of the Cornea transparens, would promise to give speedy Relief, to a Disorder, which sometimes baffles the whole Esculapian Art; nor ceases, till the Eye is fairly dissolved, as I have seen happen, more than once. This Hint I would sincerely Recommend to Gentlemen, of more extensive Practice, and particularly to the Surgeons of Hospitals.

Convulsions and Epilepsies are mentioned by Authors, to cause Cataracts; tho' from the Nature and Effect of these Disorders, I should be more apt, to fear a Gutta Serena, than a Cataract.

After investigating, in a fuller Manner, than has yet been attempted, the Nature of this Disorder, it will not be impertinent, to make a short Enquiry, if this Disorder is curable by Medicine, or by the Operation only. Various are the Secrets of Authors to cure this Disorder, which to give a Detail of, would be tiresome, as well as useless; as the most promising of them, have been
tried,

tried, without Success. But such as have a mind to amuse themselves with this sort of Enquiry will find ample Satisfaction, in *Plempius* and *Heister*.

In our Treatise on the Cataract, we have proved to Demonstration, that the Cataract is an Opacity of the Chrystalin: we have also shewn, that this Chrystalin, has no Communication with the circumjacent Parts; it now follows, that we should see, if this Disorder, is curable by Medicines only.— It is manifest, from what has been already said, in this Essay, that if it be, these Remedies cannot be internal ones; because they can, in no Shape reach the Seat of the Disorder: if any then, they must be Topicks. *Scacchus*, an eminent *Italian* Surgeon, recommends a Seton in the Neck, which he says, has cured incipient Cataracts, a thousand Times: the same is affirmed by *Paræus*, but I am pretty certain, not from positive Facts. *Galen* recommends Cupping, on the Nape of the Neck. *Errhines* are, by some recommended; and the great *Boyle*, in his Exp. Phil. says, that he knew a Man cured of a Cataract by snuffing up, from two, to three and four Grains, of *Turbith min.* every Morning. Bleeding and Purging are also recom-

recommended; but we have already shewn (by explaining the Nature of this Disorder) that these last must be rather pernicious. *Riverius* recommends warming Fomentations to the Eyes; others Pigeon's Blood. *Cardilucius*, in his Notes on *Hartman*, recommends Sp. Wine, wet in Linen, to be applied to the Eye, two or three Times a Day, for a Month, as an infallible Remedy, even where the Cataract is confirmed. The Gall of a Pike mixed with Sugar, or Sp. Wine has been, always looked upon, as a sovereign Remedy, for the Cataract; and *Scultetus* mentions a Nephew of his, to be cured, by this Means. To what has been said, I shall add some Experiments made by myself on this Head.

March 15th, 1746, I got the Eyes of three Calves, fresh killed, one I infused in Water, the second in Sp. Wine, and the third I left dry. In two Days Time, the Eye that lay in Water, seemed considerably swelled: upon Dissection, the aqueous Humour, seemed no way altered, the Chrystallin was opaque, soft, and the Laminae, of which it was composed, were separating, the vitrous Humour as usual. The Eye that lay in the Spirits was considerably contracted, the

the Cornea opaque, the aqueous Humour, turbid, the Chryſtalin opaque and hard, and the vitreous Humour whitish, and denser than usual. The other Eye, was also lessened, the Chryſtalin opaque, but no other remarkable Appearance.

In the *October* following, I put an Eye, into a Gally-pot, in which was a Dram of Sp. Vitriol, and three Ounces of Water; into another, I put a second Eye, in which was an Ounce of the Aq. Saphirine, and an Ounce of Sp. Wine; and into a third, I put White Vitriol, and Sugar of Lead, of each a Scruple, with half a Dram of refined Sugar, and three Ounces of Rose Water. I opened them, in two Day's after; and the first Eye, I found very full, and distended; the Cornea transparenſ, was of a bluish White, and pretty thick: the aqueous Humour a little Turbid, and the Chryſtalin opaque, and pretty hard; but not so much, as that of the Eye, infused in Sp. Wine. The second Eye, was lessened, or a little contracted, the Cornea white, the Chryſtalin hard and opaque; and all the other Humours clouded—the Eye infused in the Collirium, was very little altered, from that which lay in the Sp. Vitriol and Water.

In

In November 1749, I got two Drams of the Gall of a Pike, which I mixed with two Ounces of White Wine; and into this Mixture I put the Eye of a Calf, just killed, and in which the Chrystalin, thro' the Cornea, looked a little opacous, or like an incipient Cataract, and covered it up, for two Days. On Examination, the Cornea was very white and opaque, and measured in Thickness a Line, which exceeded its usual Density, by one half: the aqueous Humour clear, but the Chrystalin of a beautiful pearl Colour. On taking it (in its Capsula) out of the Eye, I found its posterior Part, perfectly transparent; which upon reimmerging in the same Mixture, for half an Hour, became completely opaque.

From these, and many other Tryals, it may be, justly doubted, if a confirmed Cataract, can be remedied by any Medicines; and I affirm that it is absolutely impossible. Nevertheless incipient ones promise fair, for a Cure, if taken timely; that is to say, when it reaches no further, than the Appearance of Clouds, or Hairs before the Eyes: In this Case, I have experienced the good Effects of the *Ophthalmick Spirit*, already mentioned; which is also of great Efficacy,

Efficacy, in all Weaknesses of Sight, provided the Patient does not complain of any Heat or Pain in the Eye, at the same time. But where the Chrystaline becomes opacous, in this Case all Topicks are useless, if not prejudicial; nor can we hope Relief, from any thing but the Operation.

Authors are much divided about the Origin of this Operation: Some will have it, the Effect of Chance: others (at the Head of whom, I place, the learned *Heister*) of sedulous Application and Anatomy. But if we reflect on the great Antiquity, of Couching: that it was in use, before Physick had any regular Principles; before the Dissection of Human Bodies, was allowed of; or even, before the coarser Parts of Anatomy, were well understood, on Quadripedes, we must change our Sentiments——*Tulpius* tells us, that Lithotomy took its Rise, from mere chance: for a Man desperately afflicted with the Stone, thro' Despair, drove a Knife into his Bladder; and the Wound which he proposed for his Destruction, proved his Recovery, by the Issue of the extraneous Body——To some thing like this, was the Operation of the Paracentesis owing. Nor in the present Case, can I help adopting

the following Story, of this Operation, which is mentioned in some antient Writers. — A Goat who had on one Eye, a greyish Opacity, or what we call a Cataract, was observed, by the Goat-herd, one Day, to fall into a Parcel of Brambles, and a large Thorn to stick in the Body of the opacous Eye, near the Border of the Sclerotica ; upon the Extraction of which, the Eye became quite clear, and the Sight was restored. From this Time, some of the most intrepid Surgeons of that time, undertook to perform this Operation ; and in imitation of the Thorn, had Steel Needles made round, and pointed ; and this by some (tho' injudiciously) is used to this Day. I cannot, with some, think this account can cast the least Obloquy, but rather reflect double Lustre on the healing Art ; to say that so trifling an Incident, by Labour and Anatomy, should give Rise to an Operation which sets us far beyond the Reach of common Mortals — for a Man blind, and who had never heard of Physick or Surgery in his Life, and who was to be restored to Sight, by such an Operation, what Idea could he form, adequate to his imaginary Merit of the Man, who,

who, as *Mr. Pope* expresses it, on a more exalted Occasion,

— from thick Films, could purge the visual Ray,

And on his darkened Eye-ball, pour the Day.

From this Time, various were the Methods, proposed by Surgeons, to shorten this Operation, and particular Accounts of which, I have given, in my Treatise on the Cataract. But since the Impression of that Work, there has appeared a new Operation, which seems to excel, any gone before it. — This acknowledges, if not for its Inventor, for its Improver, or Restorer, *M. Daviel*, a celebrated Surgeon of *Paris*. For you will find, in the above Work, that *Jesus Hali*, an eminent *Arabian*, proposed above 800 Years ago, to extract the Cataract, thro' the Pupilla, as did also *Arculanus*, a famous *Italian* Commentator. — The Antients in general, supposed the Cataract to be, a Disorder, or too great a Viscidity of the aqueous Humour: to remedy which, they proposed opening the Cornea, to discharge this Humour, in order to give place, to the Re-

generation of a purer; and to this purpose, the learned *Mayerne*, in his 12th Chapter *de Cataracta* says, that a Female Occulift perform'd such an Operation on my Lord *Rich*, Son to the Earl of *Warwick*, with Success. Surgeon *Petit* in 1708 extracted an opacous Chrystaline, on a Religious, which as it may help, to elucidate this Operation, I shall in a few Words describe, from his own Memoire, on that Head.

“ January 1st. 1708 a Priest about 60
 “ Years old, who was operated on, for a
 “ Cataract, by Mr. *Gerard*, an eminent
 “ Oculist, and which had afterwards passed
 “ between the Uvea and Cornea, I extracted
 “ in the following manner, in the Presence
 “ of M. *Mery*, Surgeon of *L'Hotel Dieu*,
 “ M. *Remy*, sworn Surgeon, and Brother
 “ *Charles St. Yves*. (This was the noted Oc-
 “ culist) I pierced the inferior and external
 “ Part of the Cornea, with a fine Needle;
 “ and being entered, into the anterior
 “ Chamber of the Eye, I pushed it on,
 “ 'till it again passed thro' the other side of
 “ the Cornea, that is to say, thro' that Part,
 “ next the internal Angle of the Eye: Then
 “ by means of a Groove in my Needle, I in-
 “ troduced the Point of a Lancer, and so
 “ opened

“opened the Cornea, from one Puncture to
“the other, and with a fine Hook, drew
“forth, the opaque Body. The Patient
“soon recovered, and can see large Objects,
“without Glasses, and read small Print,
“by the help of Spectacles.”

There is, in *Heister's* Surgery, an Account of the younger *Freitage's* describing a Method of extracting the Cataract thro' the Cornea, as practised by his Father: but then he leaves us in the Dark, with respect to the Manual, and Instruments.——Tho' the Method of Mr. *Daviel*, is now well known, to consist in an Incision of the Cornea, and so drawing out, the opaque Chrystaline; yet are there several other Circumstances to be considered, in performing this Operation, which the Publick are not yet well acquainted with: It is also known, from Experience, that this Operation is more safe and eligible, in some Cases, than in others. As Mr. *Daviel*, never yet favour'd the Publick, with a particular Detail of his Method; and as the Account transmitted to the Royal Society, was from a Spectator only, I may in some Particulars differ from him; but as my Method, is the Result of a good deal of Labour, strong Reflection, and some Experience,

rience, I am vain enough to think, that if it be not precisely his, it will be found pretty near as eligible. It will also have, another Advantage: for as I am not the Inventor, or Restorer of it, I shall consider its Advantages and Faults more impartially. To this Purpose, I shall first describe the safest Method (according to my Judgment) of performing this Operation, and then endeavour to shew its Advantages and Disadvantages. Here follows, an Account of the different Experiments I made, the better to illustrate the Process of it.

Exp. 1. I got a Sheep's Head, and with a fine Cataract Needle, perforated the Cornea, in its lateral external Angle, and as near as I could guess, two Lines and a half of the Instrument entered the Eye. Upon disengaging the Eye, from its Orbit, I found, that besides the Cornea, my Needle pierced the Iris, and Chrystalin Capsula.

Exp. 2. I got a young Dog, and having him well secured by Assistants, I attempted to perform this Operation: I therefore, with the Point of a Lancet, pierce the external and inferior Part of the Cornea; and considering the Convexity of the Choroides Anterior, or Iris, in order to avoid wound-
ing

ing it, I push my Lancet a little obliquely outwards ; and into the Opening, pass the Point of a fine Scissors : but am obliged to desist my Pursuit, on account of a small Hæmorrhagy, which offuscates the Eye. To know from whence this proceeds, I hang the Dog, and find, after all my Precautions, that I have wounded the Proceffus Ciliares.

To evade a like Accident, for the future, I have got a fine Needle, with a Grove in it, and the Top or incisive Part a little bent—for the Space between the Border of the Cornea, where the Incision is to be made, and the Choroides Anterior does not exceed a Line, or the twelfth Part of an Inch, which is a Remark, that, in this Operation, should never be forgot.

Exp. 3. I pass in another Head, a Needle, a little convex, into the Eye, and by a Grove in it, one of the Blades of a very fine crooked Scissors, and dilate the Cornea on all Sides; nor am I very careful to confine my Incision to the Edges of it only.— Upon raising up, the inferior Parts of the Cornea, I introduce a Cataract Needle thro' the Pupilla : but instead of opening the Capsula of the Chrystalin, I push my Needle into the Body of it. I then find my Needle
clogged

clogged with the Chryſtalin, and it is with Difficulty I extract it. I confine this Dog, for a couple of Days after, and then find the Cornea unequal, and opaque, in ſeveral Parts, the Conſequence of not confining my Inciſion to the Borders of the Sclerotica. By this, and the former Tryal, I find, tho' cutting the Cornea Lucida, is attended with ſome Pain, yet it is but inſignificant.

Exp. 4. After opening the Cornea, in another Head, I make a ſmall Puncture, in the Chryſtalin Capsula, and preſs externally, on the Globe of the Eye; but inſtead of diſengaging by this means the Chryſtalin, I force it, and the vitrous Humour, to which it is attached, out of the Eye.

Exp. 5. I repeat the ſame Experiment on another Eye; but inſtead of a ſmall Puncture, I dilate the whole Length of the Chryſtalin Capsula, and then preſs on the Ball of the Eye, and the Chryſtalin immediately ſlips out.

From theſe Experiments I draw the following practical Concluſions: Firſt, that the Diſtance between the Border of the Cornea Lucida, and Choroides Anterior, or Iris, ſhould be well conſidered, for fear of wounding the latter; and to ſuch as are not, minutely

minutely conversant with the Structure of the Eye, I would recommend a careful perusal, of the Plates given in my *Treatise on the Cataract*, and particularly the first and second Figures. Secondly, that in dilating the Cornea, we must be careful to confine our Incision as near the Borders of it, as possible: for a small Seam, is the necessary Consequence of a Coalition of these Parts; and this Cicatrice, if it happens to be opposite, or pretty near the Pupilla, occasions a new Obstruction to Vision. Thirdly, in extracting the Chrysalin, we should be careful to give a sufficient Dilatation, to its Capsula, least it should happen to us, as it did, to an eminent Surgeon in *London*, about two Years ago; who in performing this Operation, on a poor Man, in the *Hay Market*, by pressing hard on the Ball of the Eye, before the Chrysalin Bag, was sufficiently (if at all) opened, forced out both vitreous Humour, and Chrysalin. Fourthly, to make the Operation more expeditious, we should avoid thrusting the Needle into the Body of the Cataract, but just thro' its Covering, which with the smallest Effort will rend sufficiently, to give Issue to its enclosed Body.

These

These general Remarks premised, the Surgeon, for the Operation, should provide the following Instruments. A small Cataract Needle, whose incisive Part must be about two Lines long, and the Breadth, in proportion : the incisive Part, must have a small Curvature, and the concave Part, must be marked, in the Handle, by a black Line. A small Needle, whose incisive Part must not exceed a Line and a half, edged at its Sides, and finely rounded off, but quite strait. This last I call the Iris Needle. A Pair of Scissors, which have a Curvature in the Top : the Blade that is introduced into the Eye, must be as small as can be, and their Edges extremely sharp, so as to cut with the smallest Motion. I had some Needles, made, with the Curvature already described, and Grooves in them also, to direct my Scissors ; but I have since rejected them, for these Reasons—I found that the Groove increased the Bulk of the Needle, and made the incisive Part too thick ; that in fining down the Needle, I lessened the Groove, and to suit it to my Scissors, the Back of this last was made so sharp, as to endanger wounding the Choroides Anterior : add to this, that I found, by piercing the Cornea, with

with the Needle already described, sufficient Room without any Director, to introduce my Scissors, and dilate the Cornea. General Evacuations, such as bleeding, Physick, and a low Diet, being used for a few Days, you choose for the Operation, a clear serene Day, and fixing the Patient in a Chair, opposite a well lightened Window, place yourself in another froming him, which for this Purpose, should be a little more elevated than his. Apply over the sound Eye, some soft, Linen Compresses, and then bind up, the Eye, with a Band or Handkerchief, round the Head; which will prevent the other Eye, from rouling, as also save the Patient from some Anxiety, in knowing when, and how you go on. Having enjoined strict Silence, to the Spectators and Assistants, give the Patient an oblique Position: that is, if it be the Right Eye, you are to work on, let that Side project a little more towards you, than the other, by which you make your Incision freer. Nevertheless I would not recommend this Position, to be used, indiscriminately; for a good deal depends on the form of the Eye, and the Operator must always prefer that Posture, to his Patient, which gives himself

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the greatest Ease and Command. Let the Lids be separated, by an Assistant; and then the Surgeon holding the Handle of the Needle, between two Fore-fingers and the Thumb, with the black Line, of the Handle, fronting him, pierces the Cornea transparent, just at the Border of the Sclerotica, in the inferior middle Part of the Eye, or at its lateral external Angle, for the Choice is no way material. The Quantity of the Instrument, that has entered the Cornea, will determine whether it is thoroughly pierced, or no. It being, in a Human Eye, but about 4 Line; but a more exact Rule, is the spouting out of the aqueous Humour, which sometimes flies in your Face, at other times, dribbles down the Cheek, according to the Pressure on the Cornea, and Breadth of the Incision. The convex Part of the Needle faces the Iris, and with its Side you gently dilate the Orifice; and then you remove your Needle, and introduce the Blade of your Scissors, and dilate the Cornea at its Border, on both Sides, till you have a fair View of the Pupilla which is done, by turning up the Part of the Cornea, which has been dilated: you now introduce thro' the Pupilla, the Iris Needle, and dilate the

Chrysalin

Chrystalline Capsula, which being done, by a gentle Pressure, on the inferior Part of the Eye, you press out the Chrystalin: return the inverted Part of the Cornea, and apply to the Eye, soft Linen Compresses, moistened in Water, in which a little Saffron has been infused, and animated with a fourth Part Brandy. Let the Patient be confined to a dark Room, without much Fire, and kept to a low Diet, for three or four Days: but let him also, in this time avoid lying on either Side, but rather, if possible, sleep in a perpendicular Posture: at least, let his Head be elevated, and cause him to lye on his Back. If in pervading the Cornea, some Blood appears, in this Case, you may conclude, the Choroides Anterior is pricked, which you must endeavour to remove, by a fine Sponge, and then proceed in your Operation: but if the Blood should come more abundantly, so as to obstruct a View of the Parts, you are to proceed no further, for a few Days: for it is better to rest here, than by an obstinate Perseverance, to endanger the entire Loss of the Eye.

The Advantages of this Operation, certainly seem to give it the Preference, to all others practised before it: For, first, the Pain

A Critical Analysis

Pain of opening the Cornea is but insignificant; nevertheless, these People err greatly, who imagine it to be attended with no Pain. Secondly, by thus extracting the Cataract, you avoid every Accident, that the ablest Operator apprehends, in the different Ways, heretofore practised. Such I mean is, the violent Inflammation, the Cause of which I have shewn, at No. 83. of my Treatise on the Cataract, and the rising of the opaque Body again, which is also explained in said Number. Thirdly, you perform this new Operation with the same Ease, in the Right Eye, as the Left, which is too material an Advantage to be omitted. For the ablest Operators have declined couching the Right Eye, and for no other Reason, but the Difficulty of commanding the Left Hand. This, I say, not only from my own Experience, but also, from that of *St. Yvo* and *Taylor*; and this last, who certainly performed this Operation with more Ease than any other Man, except *Dr. Petit*, I have known more than once decline it, but gave indeed other Reasons for it. Having thus candidly shewn its Advantages, let us now turn to the other Side, and hear its defects; and as Anatomy is the Basis,

frision, rather to the Touch-stone, by which all Chirurgical Operations are tried, and which Experience approves, we shall first consider it anatomically. — To this Purpose, in December 1752, amongst some Human Eyes, which I procured in London, I pitched upon the freshest and fullest, and which seemed to suffer no Alteration. This Eye, being disengag'd from its Muscles, and Grease, weighed 148 Grains. Its Axis measured eleven Lines, and its Diameter was 10½ Lines: upon cutting of the Cornea Transparens, at the Border of the Sclerotica, from the anterior Part of the Chrysalin, the Eye measured 9½ Lines; so that allowing ½ of a Line for the Thickness of the Cornea Transparens, we shall find the Space of the aqueous Chamber to be 1½ Line: Doctor Petit once found it a Line and half, but this, he observes, was a remarkable Eye. The greatest Diameter of the Pupilla was 1½ Line; and the Chrysalin Lens, by its anterior Part, formed the Segment of a Sphere, the Subtense of which measured four Lines.

By this it appears, that when the Cornea does not project far from the Pupilla, or where the Iris has a greater Convexity than usual, this Operation may be attended with

Danger

Danger of pricking the Choroides Anterior: nevertheless, by considering the three first Experiments, and the Advantage of the Curvature in the Cornea Needle, I think this Accident may be avoided. The real Objections to this Operation are, when the Cornea is not very large, or where the Pupilla is naturally very small, which is the Case of some Eyes — for when the Cornea is not very large, the opening of the Cornea must be higher the Pupilla, and the Cicatrice will cause an almost indelible Obstruction to Vision — If the Pupilla is naturally small, it will be hard to conceive, how it can give Issue to a Body, whose Diameter, in a natural State of the Pupilla, exceeds that of the Pupilla, in a notable Degree. However, if we find, upon shutting both Eyes, and opening the affected Eye, the Pupilla a little dilated, and contracting itself, and reflect that the Pupilla is a good deal passive, and the opaque Chaystalin smaller than a sound one, we may get over this last Objection, *except the Pupilla is remarkably narrow.*

Tho' M. *David* gives this Operation great Encomiums, yet I cannot find it answer this Expectation, in a notable Degree elsewhere. In *London* it has not met with

great

great Success, tho' in *Dublin*, it bids fair for coming into Repute; for my ingenuous Correspondent, and learned Friend, Doctor *Rutty* informs me, that it has been practised with Success, by Messieurs *Dillon* and *Roony*, Surgeons of Repute and Experience in *Dublin*; but adds, that tho' each of their Patients, recovered Sight sufficient to direct them, yet the Cornea was a good deal contused, and an Opacity remained on each of them.

Tho' it cannot be expected, that a City, tho' populous enough, yet so remote from the Capital, as this, and which has not the Advantage of an Hospital, could produce many Opportunities of this Kind, yet in what Experience I have had, in this way, I always found an Opacity on the Cornea, tho' indeed not very notable—— This is not a Consequence of the simple Incision of the Cornea, but of the Use of the Scissors; because a simple Incision of the Cornea, tho' it leaves an imperceptible Seam, yet it produces no Opacity. It is the Scissors, which squeezing the Cornea, in dividing it, produces a Contusion, this an Echimosis, or rather a Rupture of some of the Lymphatics of the Cornea, and this an Opacity.

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To remedy this Defect, Doctor *Rutty* informs me, that one of the Gentlemen already mentioned, has invented a Scissors, whose Backs are sharp, and which of course cut by opening : Tho' every Attempt to improve an Art of such Consequence to Mankind, as Surgery, deserves publick Acknowledgment, yet this Invention, seems to me, to be liable to some Objections. I tried the use of this Scissors, on two Dogs ; in the first, the Point of my Scissors wounded the Choroides, and I found, that in opening it, it could not be confined to the Edge of the Cornea : In the second, though I did not wound the Choroides Anterior, or Iris, yet after my Scissors succeeded the Aperture, made by the Needle, the same Accident ensued ; besides, in continuing the Incision, the Convexity of the Choroides, convinced me, that it was very difficult, if not impossible, to dilate the Cornea sufficiently, without wounding, or the Iris, or *Hovius's* Arterial Circle. On this Account, I would recommend, to such as are inclinable, to use the Scissors here described, to cause a small Curbure to be made in them. I do not mean by this the Scissors, which from the Handle, to the Point, form a Sort of Diagonal, but one in

in which the two Points of the Blades form a sort of Arch, or Curbure, in a Parallel Line, with the Pin which unites the two Shanks; tho' till an Instrument, which we can easier command, be invented, I should prefer the Scissors described in the Operation.

But if we reflect on the Consequence of Contusions, in other Parts, and their Indications, we may perhaps, borrow some Hints to remedy this Effect here. In young People, particularly of a bilious, or plethorick Constitution, violent Contusions are succeeded by Inflammation and Abscess: In old, by Gangrene, and Sphacelus. In the first plentiful Evacuations, of bleeding, &c. and strong Repellents, mixed with Refrigerants to the Part succeed: In the latter, discutient Fomentations, and Poultices, with warm Cordials, and the Bark, in Proportion to the Indication, never fail. So here, antecedent to the Operation, the Evacuations should be proportioned to Constitution and Age: To Persons advanced in Years, they should be very sparing, if at all: to younger People, more abundant——to both, Fomentations should be applied to the Eye, to disperse any extravasated Blood, or Lymph, after the Operation. In old People, I order

these to be made of Lavender, and Rosemary Tops, with a little Fennel-Seeds, and animated with a small Portion of Brandy. To younger People I find Lavender Tops, and Rose Leaves, with a small Quantity of distilled Vinegar, to answer a good Purpose. Some Occulists recommend, after boyling any Herbs, for a Fetus for the Eye, to put them in fine Linnen Bags, and apply them hot to the Eye. But Experience has shewn me the bad Consequence of this sort of Practice, as well as pointed out, a more elegant Method. In any Disorder of the Eye, which requires hot bathing, I get thin Sheeps Bladders, and half fill them with the Liquor hot, and after tying up, I apply them to the Eye: by this means, the Pressure on the Eye is uniform, and you make your Bath to what Degree of Warmth you please.

Upon then, a careful Retrospection of what has been said, it appears, that the greatest Objection (and indeed a most material one) to this Operation, is from the Contusion, and Opacity left on the Cornea; and to remedy which, I have given such Hints, as Experience suggested to me. But I have for some time past imagined, that I found out

out a Method, to avoid this Accident entirely, which I shall briefly describe.

I was the first who observed, that the Choroides Anterior, or Iris, took its Rise, more posteriorly than the Edge of the Cornea Lucida, and which is exactly described in N. 56. p. 62. of a new Treatise on the Cataract: If then in performing this new Operation, the Point of the Needle was to pierce the Sclerotica, near, or at the Border of the Cornea Transparens, and the Incision to be continued, in this Body, I am inclined to think, from the following Reasons, that it would remove every Objection to it, and make it extremely useful to Mankind; for,

There is, no visible Communication by Blood-Vessels, between the Sclerotica, and Cornea Transparens, seeing that in the most violent Inflammation of the Eye, the Cornea has no Blood-Vessels on it; and the Experience of couching, and scarifying the Conjunctiva prove, that a Wound of the Sclerotica, affects the Cornea, in no shape except an Inflammation succeeds; and in that it is no more affected, than in a common Inflammation of the Eye. As the Sclerotica is an opaque Body, the wounding it

A Critical Analysis

not obstruct Vision, which must be always the Case, with respect to the Cornea; and as for the Loss of Refraction, by the Extraction of the Chrysalin, which some suppose to be very great, I have, in my former Treatise, proved it to be but insignificant. Where the Cornea Transparens is naturally small, this new Method will succeed, because you do not encroach upon it at all. But then, no one must attempt to undertake it, without being exactly acquainted with the Distance between the Border of the Cornea, and Rile of the Choroides Anterior, which is greater at the Sides of the Eye, than at its superior and inferior middle Part, and of Course the Distance of the Incision must be proportioned. These are the Reasons which incline me to think, that this new Improvement would be of the greatest Advantage to this Operation, which I freely communicate, without the least Reserve. But lest I should impose specious Appearances, for Reasons, in a Case of this Moment, I must admonish my Readers, that I have yet made no Experiments to corroborate these Arguments. This has not been for want of Inclination to instruct myself, but for want of Time. Nevertheless,

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vertheless, when more convenient Opportunities occur, I do intend first trying it on living Quadrupeds, and according to the Success, upon human Subjects——In the mean time, I thought proper to mention this, in Hopes others would improve, and push on these Hints.

Tho' the Cataract, both in Theory and Practice, is now reduced to the clearest Demonstration, yet I am sorry to say, that there are many other Disorders of this Organ, which are little known, or understood. If more Years and Experience shall enable me to make any real Improvements on them, or any other Branch of my Profession, I shall think my Time and Application well laid out; being determined if I cannot add to the Stock of Physick, not to encrease it's Bulk, in Opposition to a Saying of one of the politest Satyrists of Antiquity,

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